UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,390	08/29/2001	Richard L. Solomon	00-452	9712

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EXAMINER
KING, JUSTIN

ART UNIT	PAPER NUMBER
2111	

DATE MAILED: 01/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this c mmunication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>21 September 2004</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-25* is/are pending in the application.

　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-17,19-23 and 25* is/are rejected.

7)☒ Claim(s) *18 and 24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　a)☐ All　b)☐ Some *　c)☐ None of:

　　1.☐ Certified copies of the priority documents have been received.

　　2.☐ Certified copies of the priority documents have been received in Application No. _____ .

　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
　Paper No(s)/Mail Date _____ .

4)☐ Interview Summary (PTO-413)
　Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____ .

DETAILED ACTION

Claim Objections

1.   Claim 20 is objected to under 37 CFR 1.75(c), as being of improper dependent form for

failing to further limit the subject matter of a previous claim. Applicant is required to cancel the

claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the

claim(s) in independent form. Claim 20's limitation is the claim 14's last limitation.

Drawings

2.   Applicant is reminded that the drawings on record are not formal drawings.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

> 1.   Determining the scope and contents of the prior art.
> 2.   Ascertaining the differences between the prior art and the claims at issue.
> 3.   Resolving the level of ordinary skill in the pertinent art.
> 4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

4.   Claims 1-5, 7-17, 19-23, and 25 are rejected under 35 U.S.C. 103(a) as being

unpatentable over the admitted prior art and Daniel Kovacs' "Tutorial on Linked Lists".

Referring to claim 1: The prior art "head-of-list alternation" discloses recognizing a delay

in completion of a first read command in the queue and in response designating the first read

command as a first delayed read command (Application, page 2, lines 16-19) and determining

that the command in the queue following the delayed read command is a read command, and

recognizing a delay in completion of the second read command in the queue and in response

designating the second read command as a second delayed read command (Application, page 2,

lines 19-20). Although the prior art discloses recognizing the second read command and does

not explicitly disclose recognizing the third read command, the prior art teaches that recognizing

the following read command is known in the computer art; furthermore, the prior art teaches that

it is known to utilize a 2-node linked-list in managing the read commands.

The prior art does not explicitly disclose the loop start pointer and loop end pointer, but

since the prior art only utilizes two nodes in managing the read commands, the first node is

equivalent to the loop start pointer and the second node is equivalent to the loop end pointer.

Kovacs discloses that the linked list/loop is known in the computer art to manage the

memory/data. Kovacs discloses that each linked list/loop has a head and tail, which is the loop

start pointer and loop end pointer respectively. Since the linked list is known to manage the

memory/data, and the linked list's head is the first element of the list and the tail is the last

element of the list, the head will direct to the first delayed read command and the tail will direct

to the last delayed read command. Hence, the linked list's head is to identify the first delayed

read command and the linked list's tail is to identify the second read command when the second

read command is the last read command in the list. And when a new element is added at the end

of the linked list (Kovacs' Adding an element to the tail of a linked list), the tail will move to the

new element, which is advancing the loop end pointer to identify the third read command.

Although Kovacs' linked list also involves memory allocation, Kovacs teaches that the loop

mechanism is known to manage the memory/data.

The prior art discloses completing the read command of the head-of-list before

attempting next command, and the Kovacs teaches how to manage and expand any linked list.

Kovacs' teaching enables one to expand the loop (two-node linked list) to have more than two

nodes. Hence, it would have been obvious to one having ordinary skill in the computer art at the

time Applicant made the invention to adapt Kovacs to the head-of-list alteration because the

Kovacs teaches the linked list/loop as a dynamic data/memory managing scheme, which enables

one to increase the linked list dynamically.

Referring to claim 2: Kovacs discloses the removing an element from the head of a linked

list, which sets the next element in the list to be the head, which is advancing the loop start

pointer to identify the second delayed read command after the first delayed read command has

been completed.

Referring to claim 3: The prior art discloses recognizing a delay in completion of the a

read command and in response designating the read command as a delayed read command and

determining that the command in the queue following the read command is a read command.

Kovacs discloses adding an element to the tail of a linked list, which is advancing the loop end

pointer to identify the fourth read command.

Referring to claim 4: The prior art discloses that is known to recognize the completion of the read commands (Application, page 2, line 24). Kovacs discloses terminating the linked list if the head is also the tail, which is eliminating the loop start pointer and the loop end pointer upon recognizing the completion of all but the one read command.

Referring to claims 5 and 7: The prior art's means for selecting the command to be processed and Kovacs' means for scanning through linked list are the queue pointer. Since the prior art only process the commands in the head-of-list and the Kovacs teaches one on how to manage and to expand any list, Kovacs enables the prior art to adjust the position of the queue pointer to move through the commands at and between the loop start pointer and the loop end pointer until all of the commands at and between the loop start pointer and the loop end pointer have been completed.

Referring to claim 8: The prior art discloses that the command is unloaded once completed, the unloaded is the invalid marking.

Referring to claim 9: Kovacs discloses advancing the head to the same node as the tail pointed (Kovacs' Removing an Element from the head of a linked list), which is advancing the loop start pointer to identify the same command that is identified by the loop end pointer.

Referring to claim 10: Kovacs discloses terminating the linked list when the head is the tail (Kovacs' Removing an Element from the head of a linked list), which is abolishing the loop by eliminating the loop start pointer and the loop end pointer upon loop start pointer identifying the same command that is identified by the loop end pointer.

Referring to claim 11: Kovacs discloses the removing an element from the head of a linked list, which sets the next element in the list to be the head, which is advancing the loop

start pointer to identify the second delayed read command after the first delayed read command

has been completed.

Referring to claim 12: The prior art discloses advancing to the next subsequent read

command in the queue upon experiencing a delay in completing the read command previously

identified.

Referring to claim 13: The prior art "head-of-list alternation" discloses a command queue

of a command buffer in a bus interface controller for communicating commands and data, the

attached bus is the data mover for transferring commands to a target device and receiving

responses from the target device. The logic/algorithm of the "head-of-list" is the queue

processor, which selects and processes the first read command from the buffer, and recognizing a

delay in completion of a first read command in the queue and in response designating the first

read command as a first delayed read command (Application, page 2, lines 16-19) and

determining that the command in the queue following the delayed read command is a read

command, and recognizing a delay in completion of the second read command in the queue and

in response designating the second read command as a second delayed read command

(Application, page 2, lines 19-20).

The prior art does not explicitly disclose the loop start pointer and loop end pointer, but

since the prior art only utilizes two nodes in managing the read commands, the first node is

equivalent to the loop start pointer and the second node is equivalent to the loop end pointer.

Kovacs discloses that the linked list/loop is known in the computer art to manage the

memory/data. Kovacs discloses that each linked list/loop has a head and tail, which is the loop

start pointer and loop end pointer respectively. Since the linked list is known to manage the

memory/data, and the linked list's head is the first element of the list and the tail is the last

element of the list, the head will direct to the first delayed read command and the tail will direct

to the last delayed read command. Hence, the linked list's head is to identify the first delayed

read command and the linked list's tail is to identify the second read command when the second

read command is the last read command in the list. And when a new element is added at the end

of the linked list (Kovacs' Adding an element to the tail of a linked list), the tail will move to the

new element, which is advancing the loop end pointer to identify the third read command.

Although Kovacs' linked list also involves memory allocation, Kovacs teaches that the loop

mechanism is known to manage the memory/data.

The prior art discloses completing the read command of the head-of-list before

attempting next command, and the Kovacs teaches how to manage and expand any linked list.

Kovacs' teaching enables one to expand the loop (two-node linked list) to have more than two

nodes. Hence, it would have been obvious to one having ordinary skill in the computer art at the

time Applicant made the invention to adapt Kovacs to the head-of-list alteration because the

Kovacs teaches the linked list/loop as a dynamic data/memory managing scheme, which enables

one to increase the linked list dynamically.

Referring to claim 14: Since the prior art discloses completing the read command of the

head-of-list before attempting next command, and the Kovacs teaches how to manage and

expand the list, Kovacs' teaching provides loop start pointer and loop end pointer to the prior art

so the prior art can complete the read commands at and between the loop start pointer and the

loop end pointer until all of those read commands have been completed before attempting to

complete other commands in the queue.

Referring to claim 15: The prior art discloses recognizes responses from each target device indicating completion of a read command transferred to the target device (Application, page 2, line 24). Kovacs discloses the removing an element from the head of a linked list, which sets the next element in the list to be the head, which is advancing the loop start pointer to identify the second delayed read command after the first delayed read command has been completed.

Referring to claims 16-17: The prior art discloses that is known to recognize the completion of the read commands (Application, page 2, line 24). Kovacs discloses terminating the linked list if the head is also the tail, which is eliminating the loop start pointer and the loop end pointer upon recognizing the completion of all but the one read command.

Referring to claim 19: Since the prior art discloses completing the read command of the head-of-list before attempting next command, and the Kovacs teaches how to manage and expand the list, Kovacs' teaching provides loop start pointer and loop end pointer to the prior art so the prior art can complete the read commands at and between the loop start pointer and the loop end pointer until all of those read commands have been completed before attempting to complete other commands in the queue.

Referring to claims 20-21: Since the prior art discloses completing the read command of the head-of-list before attempting next command, and the Kovacs teaches how to manage and expand the list, Kovacs' teaching provides loop start pointer and loop end pointer to the prior art so the prior art can complete the read commands at and between the loop start pointer and the loop end pointer until all of those read commands have been completed before attempting to complete other commands in the queue. Since the pointer is limited within the loop, it overrides

the normal positioning of the queue pointer positioning functionality of the interface controller to control the positioning of the queue pointer when the loop has been established.

Referring to claim 22: The prior art discloses that the command is unloaded once completed, the unloaded is the invalid marking.

Referring to claim 23: Kovacs discloses the removing an element from the head of a linked list, which sets the next element in the list to be the head, which is advancing the loop start pointer to identify the second delayed read command after the first delayed read command has been completed.

Referring to claim 25: Although the prior art does not disclose the fourth delayed read command, the prior art teaches that recognizing the following read command is known in the computer art and both MPEP and the court has held that duplication of the essential working parts of a device involves only routine skill in the art (MPEP 2144 and St. Regis Paper Co. v. Bemis Co., 193 USPQ 8); thus, recognizing the third read command involves only routine skill in the computer art.

Response to Arguments

5.   In response to Applicant's argument regarding to claim 20's objection (Remark, page 18): Applicant argues that the "normal position" is not claimed in either claim 13 or 14, thus, claim 20 does further limit the subject matter of the previous claim. The so-called "normal position" is recited on the claim 20's 2nd line, where it states "the commands of the command buffer are **normally** selected for completion by queue pointer to identify the command of the command buffer selected for completion". The term "normal" carries no weight except describes the standard operation. Applicant further argues that there is no reference to a "queue pointer" or to a "queue pointer positioning functionality". Claim 13 recites a start pointer, a end pointer, and an advancing means, which are the disputed "queue pointer" and "queue pointer positioning functionality".

6.   In response to Applicant's argument that the head-of-list alternation will not look at the third command and will not work with more than two commands (Remark, page 21, last paragraph, lines 2-3, page 22, 3rd paragraph, line 7, page 23, 2nd paragraph, lines 5-7, page 24, last 2 lines): The head-of-list teaches that it is known to manage read commands with a two-node linked list and it is known to process next command while waiting for a delay transaction. The design and the characteristic of the alternation in the head-of-list limit the capacity to only two commands (two nodes). Kovacs teaches one on how to manage/create a multiple-node linked list, which enables one to expand the two-node linked list as used in the head-of-list.

Allowable Subject Matter

7.   Claims 18 and 24 are objected to as being dependent upon a rejected base claim, but

would be allowable if rewritten in independent form to overcome the rejection(s) under 35

U.S.C. 112, set forth in this Office action and to include all of the limitations of the base claim

and any intervening claims.

8.   The following is a statement of reasons for the indication of allowable subject matter:

        Referring to claim 18: The prior arts on record do not disclose or teach that *while*

remaining only one delayed read command, applies another command being a command not

included in the loop before the loop was abolished.

        Referring to claim 24: The prior arts on record do not disclose or teach that *advancing*

the loop end pointer to the next subsequent read command in the command buffer upon

recognizing the first delay in completing the preceding read command.

Conclusion

9.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time
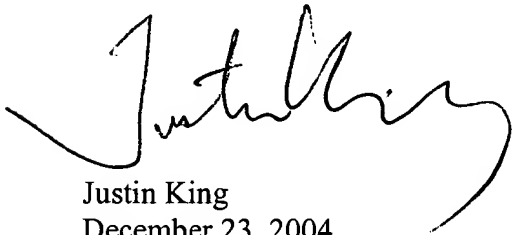
policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Justin I. King whose telephone number is 571-272-3628. The

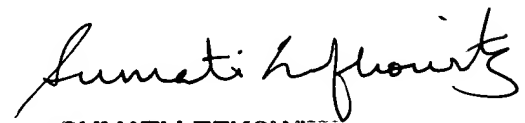examiner can normally be reached on Monday through Friday, 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mark Rinehart can be reached on 571-272-3632. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Justin King
December 23, 2004

SUMATI LEFKOWITZ
PRIMARY EXAMINER